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ABSTRACT

Educators and administrators have many things to consider before setting up a distance education facility at their schools. They will first need to decide what type of distance education technology will best benefit their students and schools. Administrators will need to decide if they want to use programming that is locally controlled or purchased from a national provider, as well as how much money they can afford to spend on such technologies, and whether to set up cooperative networks to offset the costs. Instructors must be trained in how to use distance education technology in order to provide effective computer-based education. This paper discusses the role of television-based and Internet-based instruction in distance education as a means of improving and expanding curriculums, and increasing educational opportunities in rural and remote school districts. Use, considerations, assessment, and limitations are outlined for both television-based and Internet-based instruction. (Contains 23 references and 2 appendices of further readings and Web sites of interest.) (AEF)

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Improving School Curriculum Through Technology

by
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Improving School Curriculum Through Technology

The world of technology is indeed an awe-inspiring one, and oftentimes this fast paced technological society makes many people feel that they wake up in a new world each day. Some people find this world exciting while others find it intimidating and challenging. Certainly, for educators and administrators, who are faced with incorporating technology in the classroom, this ever-changing world often seems overwhelming (Teachers Face a Techno-Culture Shock, 1999). These people are constantly faced with the enormous task of bringing the latest and most up-to-date educational systems to their students, and it would appear that with the twenty-first century fast approaching distance education can help make this task a bit easier.

Although distance education has existed through correspondence courses since the mid 1800's, the term has taken on new meanings in the last several years. The California Distance Learning Project uses the following definition: "Distance Learning (DL) is an instructional delivery system which connects learners with educational resources. DL provides educational access to learners not enrolled in educational institutions and can augment the learning opportunities of current students" (California Distance Learning Project, 1999c). However, the United States Distance Learning Association narrows the definition of distance learning to delivery methods that involve electronic devices and print materials, where instructors and learners are geographically separated (California Distance Learning Project, 1999c).

Today, many people in the educational field (Chance, 1996) view distance education as a desirable vehicle for delivering instruction to students in remote or isolated locations. Oftentimes rural schools have found that distance education has broadened

certain opportunities not only for students but also for teachers. Many districts have used distance learning to provide quality education for their students in rural areas making them more competitive with their larger counterparts, urban school districts (East Texas Learning Interactive Network Consortium, 1997). Districts have also used this technology to broaden educational opportunities for teachers through increased staff development opportunities (Barker & Dickson, 1996).

Jakupcak and Fishbaugh (1998) refer to distance education as a horse of a different color. However, it would appear that this horse has many colors. For example, students can take foreign language courses such as German or French, classes which are not usually found on curriculum schedules in rural schools. When taking these foreign language classes, students can converse in their new language with students in other schools and other districts learning the same language all with the use of interactive television. Also, with the click of a few keys students can find themselves inside an active volcano via the Internet. Because distance learning is inclusive of so many different forms of education, we have for organizational purposes divided the following information into television based instruction and Internet based instruction. And, again, because each category has the potential for containing such a vast amount of information, we have subdivided the categories using the following: (a) use, (b) considerations, (c) assessment, and (d) limitations. In addition, we have included a list of further readings. (See Appendices A & B.)

Television Based Instruction

Use.

Many rural school districts have broadened their curriculum choices for students through the use of television based educational programs. For instance, schools and school districts throughout the states of Texas, South Carolina, Massachusetts, and Arkansas (just to name a few) were some of the forerunners in the televised educational field increasing their educational curriculums in the areas of arts, health, math, language arts, science and technology, social studies, and world languages. Not only have schools found television based instruction beneficial for enlarging the number of classes offered to students, but many have found that this type of program can enable them to build a solid foundation for certain curriculums. In 1997, some 170 various high schools across the United States added German by satellite to their secondary schedules. Many of these schools later requested that their satellite provider, Oklahoma State University, add German courses for elementary grades thereby building a foundation for their foreign language courses at these earlier grades (Boverie, 1997).

Other than expanding curriculums for students overall, television based instruction has also aided rural and remote school districts in additional ways. Some smaller rural schools, for example, find it difficult if not impossible due to limited funds and other problems to offer college bound students extensive enrichment and/or advanced placement programs. With the help of television based instruction more and more smaller schools are now able to offer these kinds of programs. As well many community colleges and universities are now offering high school students concurrent enrollment options through the assistance of televised education. Many teachers have found that by

using this type of technology they can bring in outside speakers to the classrooms who would otherwise not be available. Teachers have also found that showing students abstract concepts through visual simulation aids student comprehension (Polyson, Saltzberg, & Godwin-Jones, 1996). Furthermore, educators have found that collaborative learning projects for students are endless (Starr, 1999). For example, educators can combine students from different social, cultural, economic, and experiential backgrounds for an enhanced learning experience. However, students are not the only ones who benefit from televised education. Teachers and administrators in rural areas can benefit as well through a larger selection of staff development programs or even graduate degree oriented programming (Beckner & Barker, 1994).

Considerations.

When using television based instruction, there are some considerations that should be taken into account. First, there are considerations for the instructor. Near the beginning of the course, these people should make sure that students as well as themselves understand and are comfortable with the new means of communication. During this time focusing on the students and not the delivery system should also humanize the course. Instructors need to remember to distribute appropriate assignments and worksheets well ahead of the broadcast date. Likewise, they need to remember to welcome every site at the beginning of each broadcast and take roll or appoint site facilitators to take roll. During instruction periods teachers need to be certain that each site is participating by inviting them into discussions with thoughtful and specific questions and by allowing students at distant sites to lead discussions. Teachers need to be aware that technical linkages might increase the time it takes for students to hear them

and respond. Another point instructors need to keep in mind is body language keeping it as positive and attentive to off-site groups as possible. Finally, it is a good idea for instructors to evaluate and allow students to evaluate the class after each session and use these evaluations to prepare for the next session (California Distance Learning Project, 1999a; Jakupcak &Fishbaugh, 1998). Of course, there are many other considerations for instructors, but these are a few of the more basic ones.

The second item to take into consideration when using television based instruction is production factors. The placement of the cameras, so that students off-site can clearly see what the instructor is working on no matter what instructional tools, overheads, chalkboards, films, etc. are being used, is always important. Moreover, the placement of cameras so that the students in the off-site facilities can see students in the on-campus classroom studio speaking or responding to questions is helpful (Egan & Sebastian, 1997). As well as the placement of cameras, the microphones and audio elements are important factors to consider. All students, whether they are on or off campus, should be able to clearly hear any and all questions asked by any student no matter where he or she is located. One consideration for this might be to install microphones in the ceiling instead of on the desktops (A Distance Learning Starter Kit, 1999).

In addition, the role of the facilitators is very important. First of all, instructors and administrators need to decide if on-sight facilitators need to have content knowledge of the materials being taught. Building facilitators need to know how to contact instructors if and when problems arise. Likewise, these people need to know prior to the course beginning how the instructor wants to receive student papers. In conjunction with this, facilitators need to be aware in advance how they will be receiving and distributing

work to students. Finally, facilitators need to have knowledge of the equipment used in the classrooms.

Assessment.

Integrating a variety of assessment procedures through interaction and feedback is critical for any television based educational program. Instructors can give students off-site immediate feedback and suggestions on their work by using an overhead camera. By placing this camera directly over the instructor's desk, he or she will be able to give students visual samples to guide students with their assignments. Getting papers assessed and returned to students as soon as possible is important when teaching any course. When using televised based instruction, teachers can use electronic mail, fax, or regular mail when returning and commenting on students' work. In addition to these means of delivery and communication, instructors can also use one-on-one conference calls, videos, and computer conferencing. And, certainly personal visits to each site are always helpful. Whenever possible, instructors should try to schedule visits to each site early in the course, and perhaps conduct class, if the technology allows, from each of the off campus sites.

Limitations.

As with any form of educational program, there are certain limitations to television based instruction. Classroom teachers constantly use visual clues to assess when students are confused, tired, or even bored, and they adapt their teaching to meet the needs of the students in the class at that time. However, with televised instruction teachers have little or no visual clues to use to enhance the delivery of instructional content (Pullen & Benson, in press). In order to accommodate for the lack of visual clues

and the lack of self-discipline some students have, many distance learning programs use adult supervisors at each off campus site. Furthermore, depending upon the skill level and the courses being taught some programs may need a skilled professional playing an active role in the students' overall learning and development at each of the off campus sites. Pullen & Benson (in press) found that the biggest weakness of television based instruction was the limited interaction between the instructor and the off-site students. This limitation can especially be troubling when a school is using taped televised instruction methods. However, when examining live versus taped formats of televised educational programs, Boverie (1997) found that watching the programs taped had the same educational effect on students as watching the programs live.

For further readings, consult Appendix A.

Internet-Based Instruction

Use.

The Internet is a collection of many different networks and organizations that cooperate so that information can be exchanged between them. Because of its scope, the Internet is a tremendous research tool for instructors and students (Jones, 1998). As long as reputable sites are accessed, nearly any subject can be studied on-line. Indexes and search engines facilitate topic searches on the Internet. Indexes are listed by categories of information (news, sports, current events, etc.). By selecting a category, the user moves to subcategories that become more specific until the desired information is found. Search engines ask the user to type in a word or phrase. The search engine locates sites which contain the words or phrases and lists the site addresses. Not all of the sites will be applicable, and the more specific the search, the more accurate the results.

Along with being a research tool, the Internet can also allow virtual field trips for students who might otherwise not be able to participate in an activity or visit a location anywhere in the world. Virtual field trips, using various technologies, have been advocated as an excellent resource in rural education (Chance, 1996). Internet sites exist for museums, historical sites, scientific phenomena, geographical sites, and many other places and events, and especially in rural settings, these sites can enhance curriculum opportunities in otherwise impossible ways.

Other benefits of web-based learning include more classroom oriented activities. For examples, teachers and students can both benefit from on-line course outlines because in this environment, teachers can easily update course materials when needed, and students can access the material easily. Web pages can also list assignments and announcements. As well, classroom home pages can allow interactivity among students. Finally, students enjoy learning online because instructors can easily include sound, images, and even video (Polyson, Saltzberg, and Godwin-Jones, 1996).

Electronic mail, or e-mail, is a commonly-used feature of the Internet. The greatest benefit of e-mail is that it allows communication between people in any geographical area if they have Internet access. The communication can be synchronous or asynchronous, allowing a broader range of teaching options. Two primary uses of e-mail are communication between instructor and student and communication between students. In a distance environment, the rapidity of communication between instructor and student made possible by e-mail makes it a valuable asset for learning (Bradshaw, 1997). Additionally, e-mail can also be used for research if students establish an e-mail

communication with an expert in the field they are studying, and surprisingly, many subject-matter experts are more than willing to participate in this.

Often in an educational setting, the instructor wants to send a message to all the students or wants to give the students a chance to communicate with each other. E-mail mailing lists allow the instructor to create a master list of everyone in the class; then one message can be sent to all students simultaneously. Many students prefer communicating with either an instructor or other students by e-mail. In fact, group work seems to be quite effective through electronic communication. Klemm (1997) offers several advantages to electronic collaboration. First, students enjoy participating in discussion groups when their peers are not directly observing them, and shy students participate more as aggressive students are more subdued. Next, because of its potentially asynchronous nature, slower learners have less stress, and all students have the time to produce their best work. Finally, an advantage to computerized group work for the instructor is that it allows the teacher to monitor and comment on the discussion without physically being part of the group.

Considerations.

To successfully use the Internet in the classroom, the school needs to obtain inexpensive access. Although all Internet access has become less expensive, even greater discounts are possible for educators by using local Internet service providers. Contact these providers for educational discounts. A second solution is to form partnerships between public schools, universities, and business to allow expanded curriculum with funding for the necessary hardware and software. These partnerships have helped

provide Internet access for students to give them an advantage for work and college (Clark & Brill, 1997).

Once the Internet has been linked to the classroom, the teacher needs to insure that all students have equal access to the computers so that no student has an unfair advantage over another. The instructor then faces the challenge of having to teach both Internet-use skills and curriculum skills at the same time. Students may feel intimidated if they are not knowledgeable in computers (California Distance Learning Project, 1999).

When using the web, instructors and students should consider the source of the information, which can be determined by the final three characters of the address (.org, .edu, .com, etc.). Information is usually more reliable if it is found in a site controlled by the government, an organization, or an educational facility. Commercial sites are the least reliable and are the most likely to contain objectionable material.

Assessment.

A useful feature of the Internet in distance education is the availability of test-generating computer software and Internet-based shareware and freeware. These packages allow an instructor to create activities and assessment items for the Internet in which the tools score themselves. A problem with distance education is providing feedback to students in a timely manner, and this software frees the instructor from having to grade everything by hand. One freeware package, "Hot Potatoes," includes six activity generators, multiple choice, short answer, jumbled sentence, crossword, matching/ordering, and fill in the blank, for both Windows 95 and Mac.

Limitations.

Although e-mail is a powerful tool, it has educational considerations. First, instructors and students need to realize that e-mail messages are not very private. One should always assume that the contents of an e-mail message can be read either by accident or by hackers. A second negative feature of e-mail is the potential for "spamming," receiving unwanted "junk" e-mail. Because e-mail addresses are obtainable, commercial advertisers can create huge mailing lists and send unwanted advertisements. Spamming can be avoided by using filtering shareware, freeware, or e-mail software.

When incorporating the World Wide Web in class, the greatest concern that instructors face is monitoring the information their students can access. No instructor wants a student going home and saying, "Guess what I saw today?" As a result, the Internet has come under criticism from groups concerned with some of the available sites. However, like anything else, the Internet is a tool, and the instructor must determine that it is being used properly (Gralla, 1998). The best solution is to give structured Internet assignments and pay attention to what the students are doing in class. Another way of monitoring the sites that students access is by checking the log of sites available on the computer's hard drive. The third method of restricting Internet access is by using limiting software or shareware packages (Zehr, 1999). Further, some online services, like CompuServe, American Online, and Prodigy have blocking devices. These tools can help the instructor use the Web for the many benefits it can offer educators.

For further readings, consult Appendix B

Concluding Remarks

Distance education appears to be the wave of the future, particularly when considering expanding curriculums and educational opportunities in rural and remote school districts. Recent developments in television based instruction and Internet based instruction make these educational vehicles useful alternatives to improving curriculums and educational opportunities for students at any level in diverse environments. South Carolina ETV states that a Congressional study noted " . . . the survival of rural school districts may hinge on the availability of appropriate affordable distance learning technology" (1999). Even if rural schools can survive without distance learning technologies, the advantages to their curricula make them an option that administrators should consider.

Educators and administrators have many things to consider before setting up any type of distance education facility at their school. Certainly, they will first need to decide what type of distance education technology will best benefit their students and schools. Administrators will also need to decide if they want to use programming that is locally controlled or purchased from a national provider. And, of course, they will need to decide how much money they can afford to spend on such technologies. To offset the cost of distance education some schools and school districts use cooperative networks, such as The East Texas Learning Interactive Network Consortium and The Education Coalition of San Clemente, California.

Finally, instructors must be trained in how to use distance education technology. Educators are more comfortable and effective when they have received training in the computer hardware and software they will be using (Fatemi, 1999). Because distance

education appears to be a viable and growing method of communicating information, even educators who did not receive technology training during their teacher preparation will be expected to use technology as they teach in the Twenty-first Century. Therefore, in this constantly changing technological world, educators are going to have to stay on the fast track of emerging educational techniques.

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Teachers face a techno-culture shock. (1999, September). San Jose Mercury News. Retrieved October 28, 1999, from the World Wide Web: http://www.21ct.org/sit08/owa/news.displayArticle?pDocid=1475

Zehr, M. A. (1999). Screening for the best. Education Week [On-line].

Available: http://www.edweek.org/sreports/tc99/articles/screening.htm

APPENDICES

APPENDIX A

Further Readings for Televised Distance Learning

Bridwell, C., Bretz, R., Devries, H., King, J., & White, B. (1996). Instructional Design For Distance Education. In Communicators handbook: Tools, Techniques and Technology (3rd ed.). Maupin House.

Arkansas Educational Telecommunications Network: http://www.aetn.org/.

Distance Education: Instructional Issues: http://www.utexas.edu/cc/cit/de/deprimer/instructional.html.

Distance Education – Oklahoma State University: http://www.osu-okmulgee.edu/dl.htm.

Kentucky Educational Television – Home Page -: http://www.ket.org/.

Massachusetts Educational Television's Mass LearnPike: http://www.meet.edu/broadcast/.

SERC: http://www.serc.org/.

Wisconsin Educational Communications Board: http://www.wecb.org/.

APPENDIX B

Further Readings in Internet-Based Learning

www.kidsdomain.com/down/

PC and MAC shareware downloads especially useful for elementary teachers

http://ourworld.compuserve.com/homepages/English_Direct/

A British website of shareware materials for teachers of English as a Second Language

http://yi.com/home/OpesSori/

A website of shareware resources and downloads for math, physics, and chemistry

www2.hometext.com

A website of shareware materials for teachers and home schooling parents, including K-12 resources and downlinks to other sites.

www.chem1.com

A website of instructional shareware for chemistry

www.pagestarworld.com/product.html

A website containing freeware virtual office applications and educational resources for teachers

www.coolfreebielinks.com

A freeware website that advertises itself as family safe that has downloadable graphics, games, and freebies for students

www.yo-mrr.com

(Pronounced, "Yo, Mr. R"), a freeware website for K-12 educators with high-tech and low-tech backgrounds.

Kirk, J. J. (1998). Internet-based instruction: An annotated bibliography. Reference Materials – Bibliographies (131) East Lansing, MI: National Center for Research on Teacher Learning. (ERIC Document Reproduction Service No. ED 419 148)

www.techlearning.com

A good technological resource for teachers. The list of web sites under "Web Sitings" is divided by subject matter and outstanding!